

# Electronics Waste Management in the US: Draft Findings

---

Verena Radulovic

U.S. Environmental Protection Agency

**Capacity Building Workshop on Spent Lead  
Acid Batteries/E-Waste**

**Tijuana, Mexico / December 4-6, 2007**



# Scope of Products Studied

---

- Residential and commercial:
  - Personal computers (desktops, portables, monitors, keyboards, mice)
  - Televisions
  - Hard copy computer peripherals (printers, scanners, multifunction devices, faxes)
  - Cell phones



# Draft Results: Where are all the Electronics?

---

Of all products sold between 1980-2004:

- Almost 50% are still in use either by the first or subsequent owners
- About 42% have already been managed via recycling or disposal.
- The remaining 9% are still in storage
  - About  $\frac{1}{2}$  of products in storage are TVs
  - About  $\frac{1}{4}$  of products in storage are PCs.



# Recycling vs. Disposal

---

- Of electronics available for EOL management in 2005, about 15% - 20% recycled and 80% - 85% disposed (largely to landfills).
- This recycled/disposed split constant between 1999 and 2005
  - the amount of material recycled has increased substantially, but so too has the amount of electronics generated for EOL management



# Amount Recycled

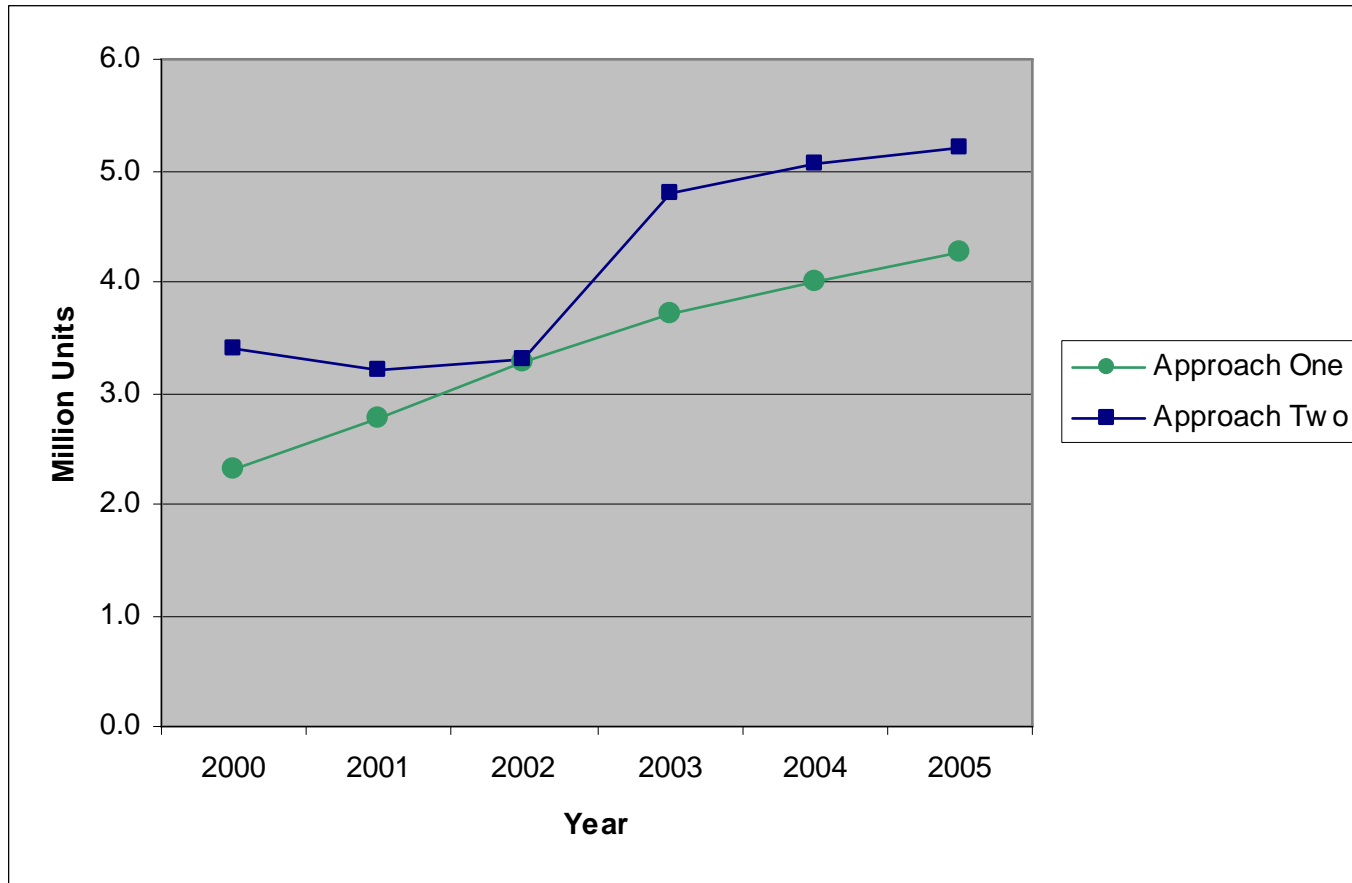
## Estimated Devices Collected for Recycling 2003 - 2005

Year	Units (million)	Tons (thousand)
2003	40.8 - 47.2	290.0 - 347.8
2004	48.3 - 52.0	320.0 - 359.9
2005	53.9 - 57.0	345.0 - 379.0



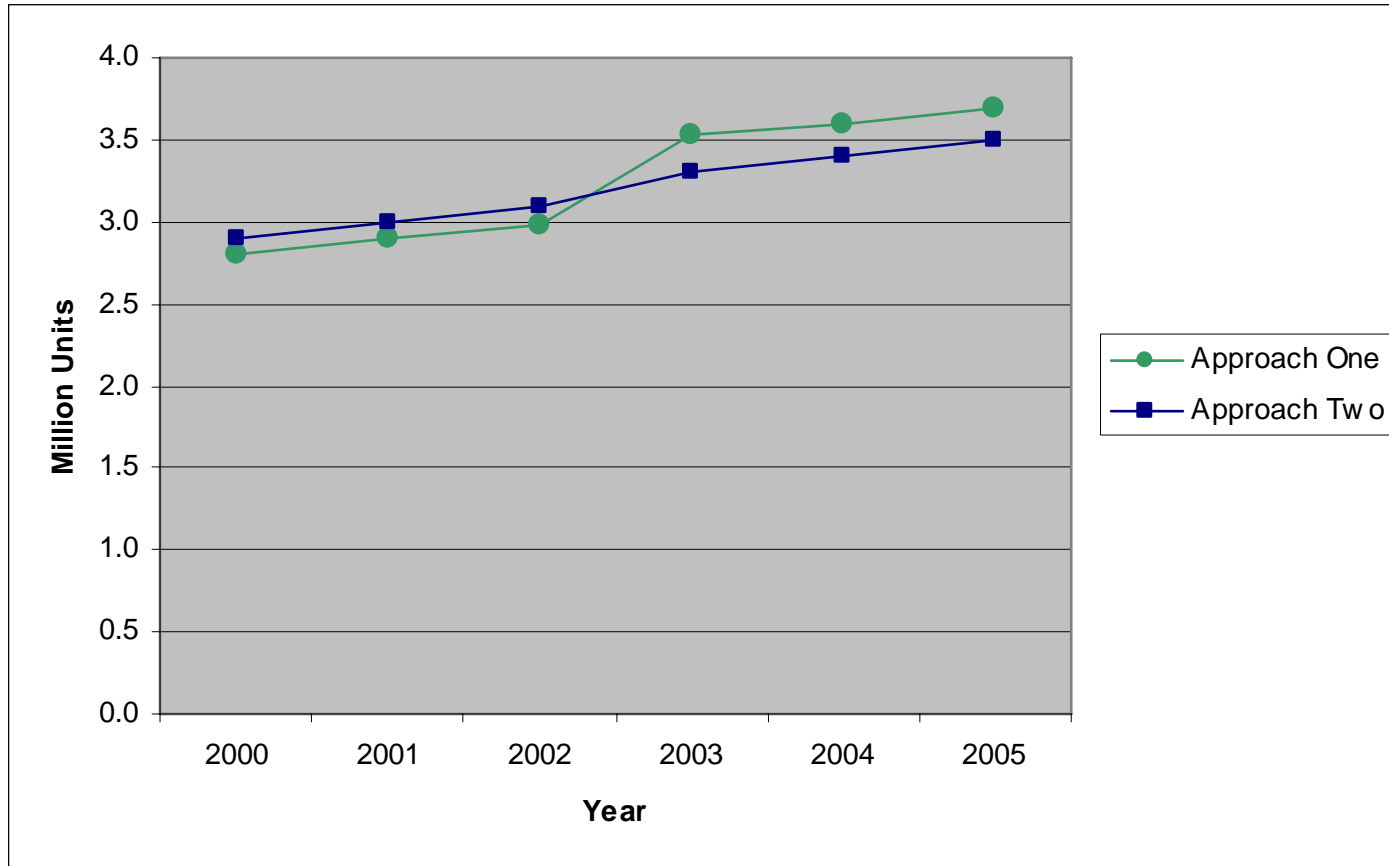
# Amount of Desktops Recycled

---

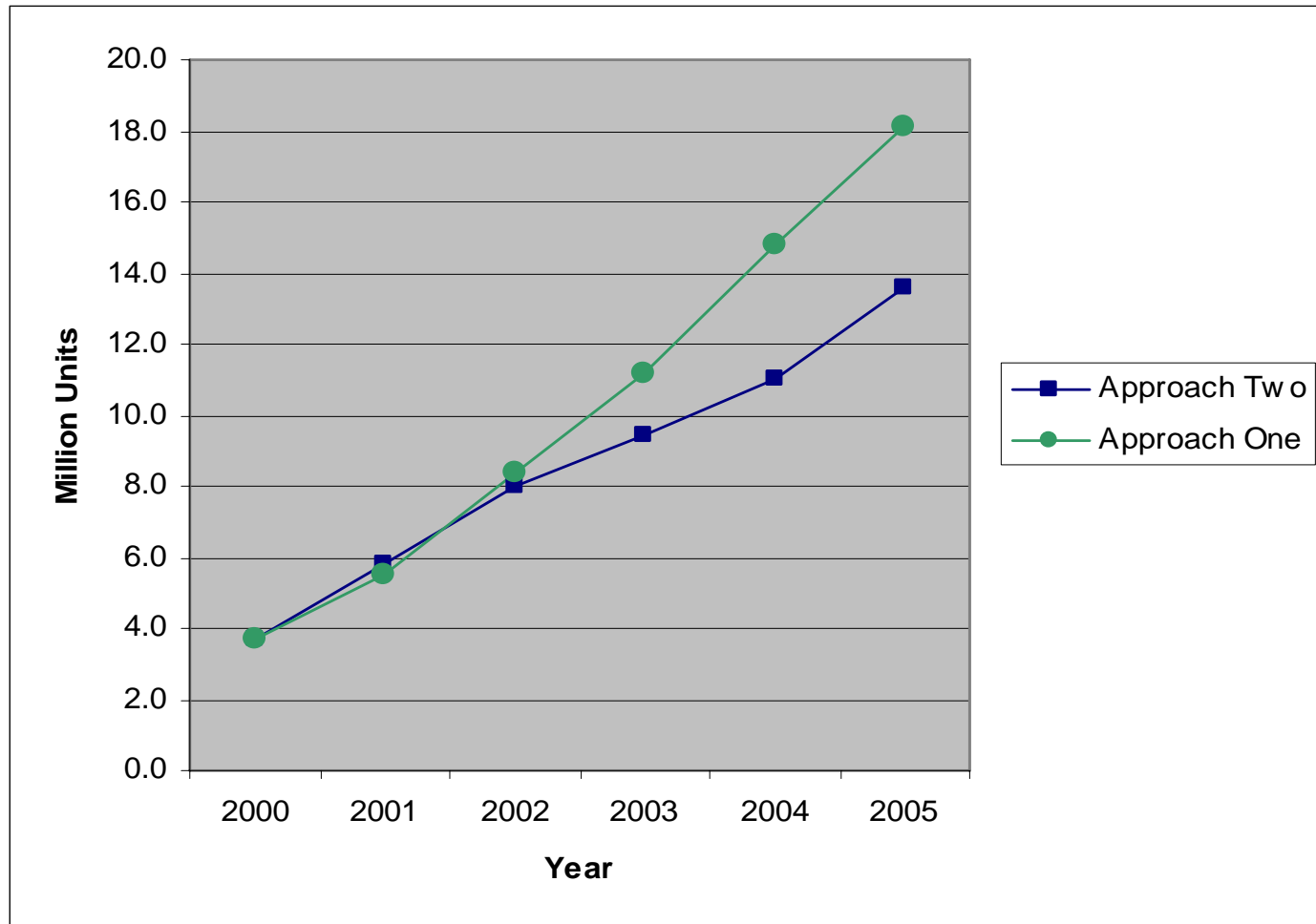


# Amount of TVs Recycled

---



# Amount of Cell Phones Recycled





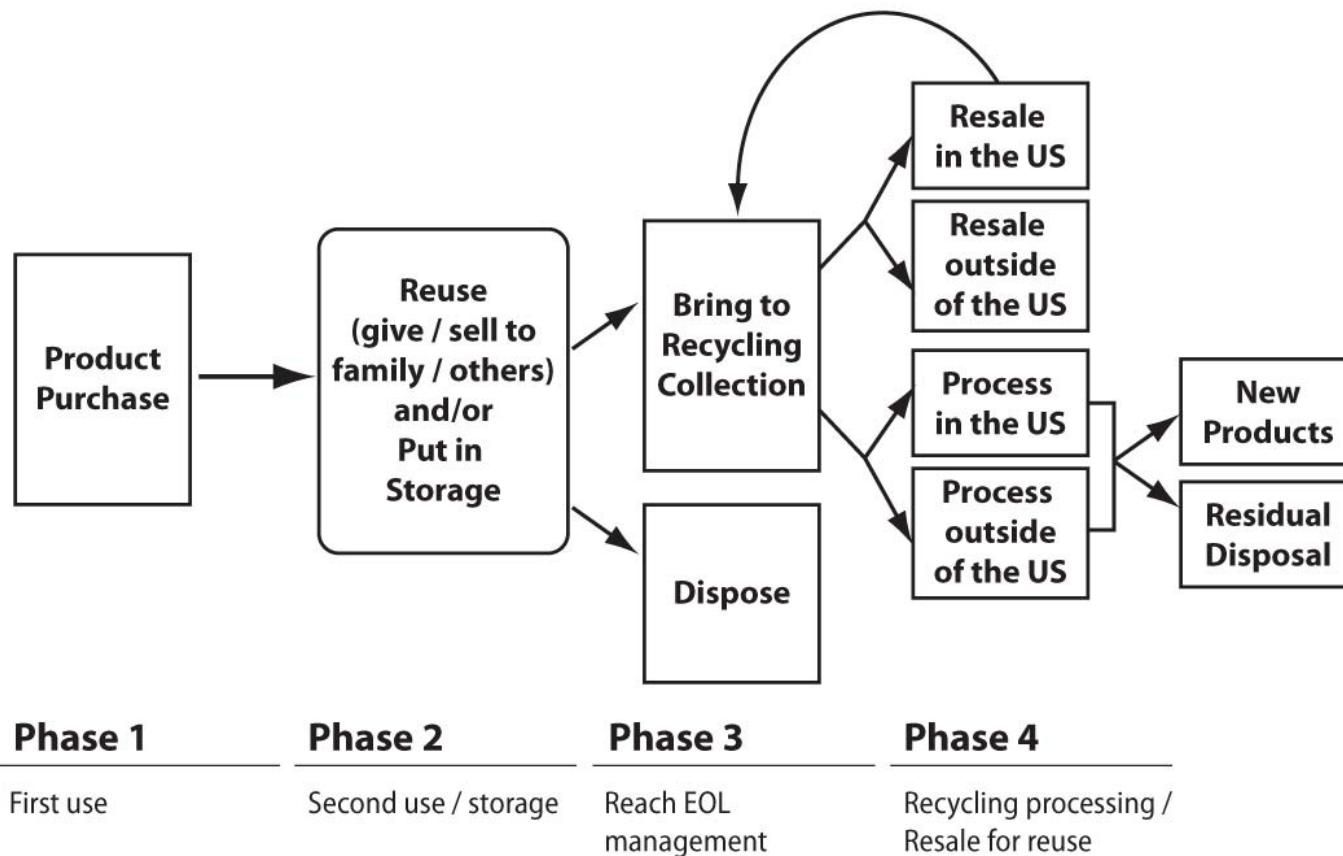
# End Markets for CRTs

---

- Relied on industry experts since no publicly available information
- In 2005
  - Approximately 61 percent, or 107,500 tons, of CRT monitors and TVs collected for recycling were exported for remanufacture or refurbishment.
  - About 14 percent, or 24,000 tons, was CRT glass sold to markets abroad for glass-to-glass processing whereas 2 percent (4,000 tons) was sold in the U.S.,
  - Lead recovery in North America accounts for about 6 percent (10,000 tons) of the material.



# The Overall Approach



**Figure 1.1 Framework for Modeling the Pattern of Product Use**



# Two Different Models

---

- Two different data sets for sales: market research and government statistics
- Both models used data from FL collection programs to derive life span; but in a slightly different way.
- Two opposite approaches to estimating amount recycled/disposed.
  - One estimated amount recycled by looking at recycling industry; calculated amount disposed from amount recycled.
  - One estimated amount disposed by looking at waste sorts; ; calculated amount recycled from amount
- Results Corroborated!



# Storage and Reuse

---

- Approach One estimated the number of units cumulatively stored as of 2005 to be 180 million products
- Approach Two estimated the annual number of products going into storage and/or reuse. In 2005 alone, approximately 460 million units were put into storage and/or reuse.



# Contacts

---

See details and models at

<http://epa.gov/ecycling.manage.htm>

For more information:

Clare Lindsay; [lindsay.clare@epa.gov](mailto:lindsay.clare@epa.gov)

Christina Kager; [kager.christina@epa.gov](mailto:kager.christina@epa.gov)

